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ENTOMOLOGICAL NEWS

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A Second Species of Elasmocorinae (Hemiptera, Reduviidae)

By H. M. HARRIS AND C. J. DRAKE, Ames, Iowa

In the December number of the Annals of the Entomological Society of America (Vol. 36, 1943), Usinger described *Elasmocoris setigerus,* new genus and species, for which he proposed the new subfamily, Elasmocorinae. We present below the characterization of a second species of this unique group of insects.

Elasmocoris comptus, new species

Size and form of *Elasmocoris setigerus* Usinger, but recognizable at a glance by the different color markings and the proportional lengths of the antennal segments.

Dark brown, the antennae, rostrum and tarsi paler, the apices of the femora, the trochanters and the basal lobe of the pronotum yellowish testaceous, alternating bands on the connexivum and a broad stripe down each side of the venter whitish testaceous. Hemelytra brown, the membrane smoky, with veins darker.

Head with impressed lines and setigerous tubercules as in *E. setigerus,* slightly broader across eyes than long, the interocular space almost four times the width of an eye, the median process distinctly broader than the antenniferous tubercule. Antennae only slightly longer than head, pronotum and scutellum conjoined (115:106), armed with spines and bristles as in *E. setigerus,* the proportions of segments one to four as 13:45:27:28.

Pronotum, except for color, about as in *setigerus,* the width across humeri (76) more than one-third greater than median length (53). Scutellum and hemelytra as in *setigerus,* the latter, however, unicolorous brown. Connexivum conspicuously alternated with yellowish white. Undersurface flattened and spinous as in *setigerus,* the venter with a fine, sinuous carina down each side just lateral to the midline, the portion between the carinae flat and slightly impressed. Apex of fifth segment of female venter more broadly and not so deeply emarginate as in *setigerus* Usinger. Legs stout, armed as in *setigerus,* the femora, except for extreme ends, unicolorous brown.

Length: 5.2–5.7 mm. Width: pronotum, 1.5–1.6 mm.; abdomen, 1.7–2.2 mm.

Holotype: male, *allotype,* female and one female *paratype,* Nova Teutonia, BRAZIL, July 10, 1936, Fritz Plauman (in collections of authors).

This unique form is much like the related *E. setigerus* Usinger from Paraguay, but is readily recognized by the pale posterior lobe of the pronotum, the unicolorous hemelytra and femora, the bicolored venter and the structural characters of the head, antennae and venter. It had tentatively been identified as "*Elasmodema* sp. near *erichsoni* Stal" but is unquestionably congeneric with *Elasmocoris* Usinger.

Navy Entomologist Killed in New Guinea

Lt. William M. Gordon of the Navy Medical Corps was killed in action somewhere in New Guinea, February, 1944. Lt. Gordon graduated from the University of Missouri, took a masters degree in entomology at Cornell University, and then was entomologist for the St. Louis County Health Department prior to enlisting in the Navy. He served as entomologist at the Naval Station in Corpus Christi for about two years before being transferred overseas recently. He was co-author of two papers on mosquitoes published in the November and December, 1943, issues of Entomological News.

Notes on Seasonal Variation in Lepidoptera

By Robert Whittaker and Don B. Stallings,
Eureka and Caldwell, Kansas

(*Continued from page 71*)

Typical *Eurema mexicana* (Boisduval) is the summer form. The winter form as indicated is easily distinguished from typical *mexicana*, particularly by an examination of the lower secondaries which are greatly suffused with reddish. This form, which has not been named, is described herewith:

Eurema mexicana f. hiem. **rosa** new form

Male. Expanse 39 mm. Upper surfaces: Primaries with irregular marginal black band, remainder of wing whitish, faintly yellowish at base. Secondaries: Black marginal band does not extend below M_2, remainder of wing yellowish in upper portion and whitish in lower portion. Tails long and pointed. Lower surfaces: Primaries suffused with reddish striations at apex. Base of wing yellowish, remainder of wing whitish. Secondaries completely suffused with reddish striations.

Female. Expanse 43 mm. Upper surfaces: Primaries with irregular marginal black band, remainder of wing pale yellowish. Secondaries, upper veins edged in black in marginal area, remainder of wing pale yellowish. Fringes reddish. Tails long and pointed. Under surfaces: Primaries, costal margin and apex suffused with reddish striations, base of wings yellow, remainder pale yellowish. Secondaries completely suffused with reddish striations, in turn washed with chalk.

Holotype: Caldwell, Kansas, Nov. 1, 1943. Allotype: Caldwell, Kansas, Oct. 24, 1941.

Described from 56 males and 42 females. Paratypes collected at Caldwell, Kansas during Oct. and Nov. of 1940, 1941 and 1943 by Stallings, Turner, Jenista and Toland; Victoria, Mexico during Jan. and Febr. of 1942 by Stallings and Turner; Eureka and Topeka, Kansas during Oct. and Nov. of

1939, 1940 and 1941 by Whittaker, and Cochise Co., ARIZONA, June, 1940, by Stallings and Turner.

Typical *Eurema lisa* (B. & L.) is the winter form. The summer form is distinguished from *lisa* particularly by the absence of maculation on the lower secondaries. This form is here described:

Eurema lisa f. aest. **immaculata** new form

Male. Expanse 31 mm. Upper surfaces: Both wings with irregular marginal black band. Remainder of wings bright yellow. Lower surfaces: Yellow. Faint pink apical patch on secondaries. Secondaries show a few small, faint patches of brown maculation.

Female. Expanse 34 mm. Upper surfaces: Apical third of primaries black, remainder of wing pale yellow. Secondaries with black apical patch, veins below patch edged with black, remainder of wing pale yellow. Under surfaces: Similar to male with maculation a bit more distinct.

Holotype: Caldwell, KANSAS, Sept. 2, 1943. Allotype: Caldwell, Kansas, Aug. 15, 1943.

Described from 60 males and 33 females. Paratypes collected at Caldwell, KANSAS during Aug. and Sept. of 1941 and 1943 by Stallings and Turner; Faulkner Co., ARKANSAS, June and July of 1943 by H. A. Freeman; Novelty, MISSOURI, Aug., 1943 by Stallings and Turner; Quitman, ARKANSAS, July, 1941, and Uvalde Co., TEXAS, May, 1941 by Stallings and Turner.

Eurema nicippe (Cramer) is represented by the winter form. The summer form is distinguished from typical *nicippe* by the absence of the reddish suffusion on the lower secondaries and is described as follows:

Eurema nicippe f. aest. **pallens** new form

Male. Expanse 40 mm. Upper surfaces: Primaries, irregular black border on outer margin and costal margin, remainder of wing bright orange. Secondaries, irregular black border on outer margin, remainder of wing bright orange. Under surfaces: Primaries yellow. Secondaries yellow and nearly immaculate.

Female. Expanse 48 mm. Upper surfaces similar to male but black marginal border on wings not solid in color on lower portion of each wing. Orange not as bright as in male. Under surfaces: Primaries similar to male. Secondaries, ground color yellow, mesial and discal area with heavy brownish striations, the ground color showing through being more chalky than yellow.

Holotype: Caldwell, KANSAS, Aug. 22, 1943. Allotype: Caldwell, Kansas, Aug. 12, 1943.

Described from 148 males and 89 females. Paratypes collected at Caldwell, KANSAS during June, July, Aug., Sept. and Oct. of 1938, 1941, 1942 and 1943 by Stallings, Turner and Jenista; Eureka, KANSAS during Aug., Sept. and Oct. of 1937 and 1941 by Whittaker; Lancaster, TEXAS, June, 1941 by H. A. Freeman; Augusta, GEORGIA, Aug., Oct. of 1940, 1941 and 1942 by H. W. Eustis; Harrison, ARKANSAS, July, 1940, Marathon, TEXAS, April, 1942, Osage, ARKANSAS, July, 1939, 1937, Victoria, MEXICO, June, 1941, Laredo, MEXICO, May, 1941, Zavala County, TEXAS, May, 1941, Uvalde County, TEXAS, May, 1941, Tamazunchale, MEXICO, June, 1941, Cache, OKLAHOMA, June, 1942, all collected by Stallings and Turner; St. Petersburg, FLORIDA, Oct., 1939, T. T. Conway and Dragoon, ARIZONA, July, 1940, and Rogers, ARKANSAS, Sept., 1941.

Applying the foregoing to the species discussed it would appear that the following revision is advisable:

1A. *Eurema daira* (Godart)
syn. cepio (Godman & Salvin)
delia (Cramer)
demoditas (Hübner)
1Aa. f. aest. *jucunda* (B. & L.)
ab. *fusca* (Harr.)
1Ab. f. *delioides* (Haskin)

1B. *Eurema palmyra* (Poey)
syn. cubana (H. Schaffer)
albina (Poey)

1C. *Eurema lydia* (Felder)
syn. lemnia (Felder)

1Ca. f. hiem. *eugenia* (Wallen.)
syn. solana (Reak.)
rhodia (Felder)
persistens (B. & D.)
1Cb. f. alt. *sidonia* (Felder)
1Cc. f. ♀ *pallidula* (Klots)

2A. *Eurema nicippe* (Cramer)
syn. callae (Field)
ab. *dammersi* (Gund.)
2Aa. f. aest. *pallens* (W. & S.)
2Ab. f. ♀ *flava* (Strecker)

3A. *Eurema boisduvaliana* (Felder)
syn. gratiosa (Reakirt)
3Aa. f. aest. *ingrata* (R. Felder)

4A. *Eurema mexicana* (Boisduval)
syn. damaris (Felder)
depuiseti (Boisduval)
henrici (Maria)
ab. *biedermanni* (Ehrmann)
recta (Klots)
4Aa. f. hiem. *rosa* (W. & S.)

5A. *Eurema proterpia* (Fabr.)
5Aa. f. hiem. *gundlachia* (Poey)
syn. longicauda (Bates)
5Ab. f. ♀ *alba* (Maria)

6A. *Eurema lisa* (B. & L.)
syn. stygmula (Boisduval)
thymetus *auct.* (nec Febricius)
similar *auct.* (nec Donovan, nec Godart)
clappi (Maynard)
centralis (H. Schaffer)
6Aa. f. aest. *immaculata* (W. & S.)
6Ab. f. ♀ *alba* (Strecker)

Genus PRECIS (Hübner)

The species *Precis coenia* (Hübner) exhibits the same seasonal characters that have been discussed under the genus *Eurema*. *P. coenia* itself is represented by the summer form. The winter form which differs from *coenia* in having the lower secondaries suffused with red, is described as follows:

Precis coenia f. hiem. **rosa** new form

Male. Expanse 49 mm. Upper surfaces similar to *coenia*. Under surfaces: Apex of primaries and all of secondaries completely suffused with deep reddish. Markings on secondaries so heavily covered over with this reddish suffusion as to be but faintly visible, if at all.

Female. Expanse 52 mm. Similar to male.

Holotype: Caldwell, KANSAS, Oct. 24, 1943. Allotype: Alton, Ill., Oct. 19, 1941.

Described from 80 males and 66 females. Paratypes collected at Caldwell, KANSAS during Oct., 1940, 1941 and 1943 by Stallings and Turner; Topeka, KANSAS, Oct. and Nov., 1940 and 1941 by Whittaker; Alton, ILLINOIS, Sept. and Oct., 1941 by A. G. Lauck; Augusta, GEORGIA, Oct., 1942 by H. W. Eustis; Quincy, ILLINOIS, Sept. and Oct., 1940 by E. N. Tryon; Eureka, KANSAS, Oct., 1941 by Whittaker; Chewacla Park, ALABAMA, Nov., 1942 by Stallings and Turner.

Genus NATHALIS (Boisduval)

The species *Nathalis iole* (Boisduval) also shows seasonal variation, however it differs from the previous species discussed in that the suffusion of the apex of the primaries and of all of the secondaries is greenish. This species can be divided into five phases as to seasonal variation as was done with the euremas. Phase one would be the first stage or summer form, which has the under surfaces of the secondaries immaculate. Phase five, or winter form, has these surfaces heavily suffused with green. Field described the male of phase one under the name of form *immaculata* and the female under the name of form *pallida;* in as much as *pallida* has page priority over *immaculata, immaculata* probably should be treated as a synonym of *pallida. N. iole* itself is represented by phase three specimens, in which there are two transverse greenish clouds on the under surfaces of the hind wings. The female form *luteolus* (Reakirt) has a large amount of orange on the secondaries, upper surfaces, whereas the typical females have yellow. The winter form of this species is described as follows:

Nathalis iole f. hiem. **viridis** new form

Male. Expanse 25 mm. Upper surfaces: Fore-wing, ground color yellow. Apex fourth of wing black with the marginal black bar at base very faint, in some cases obsolete. Secondaries, ground color yellow. Black bar along costal margin, with red dot in bar. Under surfaces: Apex of primaries and all of secondaries heavily suffused with green, except for white dot in center of wing and white bar in margin.

Female. Expanse 31 mm. Similar to male with black markings heavier.

Holotype: Caldwell, KANSAS, Oct. 17, 1943. Allotype: Caldwell, Kansas, Oct. 17, 1943.

Described from 265 males and 199 females. Paratypes collected at Eureka, KANSAS during Nov., 1937 and at Topeka, KANSAS during Sept., Oct. and Nov., 1938 and 1940 by Whittaker; Palo Duro Canyon, TEXAS during May, 1943 and Caldwell, KANSAS during Oct. and Nov., 1943 by Stallings, Turner, Jenista and Toland.

In conclusion it might be well to point out that some of these winter forms such as *Eurema mexicana* f. *rosa* and *Nathalis iole* f. *viridis* may have subspecific value in their more northern range, as such situations do occur in other species.

Holotypes and allotypes of all forms described in this paper are to be deposited in the U. S. National Museum, and paratypes in various museums and private collections. We wish to thank Mr. William D. Field of the U. S. National Museum for his assistance with the literature.

Delays in Publication

Should your copy of Entomological News or your reprints be late in coming, please be patient. The delay may be due to the present manpower shortage in the editorial as well as in the printing staff. Should your copy or your reprints be more than two months late, please let us know.

On Some Cuban Psyllidae (Homoptera)

By LEONARD D. TUTHILL, Iowa State College, Ames, Iowa

A small collection of psyllids recently received from Sr. S. C. Bruner of the Agronomic Experiment Station, Santiago de Las Vegas, Cuba, consists of four species, two of which have not been described. The other two species have been known but not previously recorded from Cuba.

Coelocara * *ernstii* Schwarz

Originally described from Venezuela this species came to me correctly determined. The data at hand indicate that it breeds on *Cedrela mexicana.*

Ceropsylla sideroxyli Riley

Recorded heretofore from Florida, Mexico and Puerto Rico the specimens at hand bear data indicating it forms galls on "jocuma."

Katacephala tenuipennis new species †

Figs. 3, 4, 5

Length to tip of folded wings 2.5 to 2.75 mm.

Color: General color brownish yellow. (Light green when alive.) Forewings brown along anal margin from base through apex.

Structure: Body with short pubescence. Head narrower than thorax, very strongly deflexed, somewhat retrorse. Vertex roundly swollen, nearly straight on caudal margin, narrowed anteriorly to prominent frons. Genal processes large, swollen, .6 as long as vertex, smoothly joined to vertex, contiguous except basally. Antennae 1.33 times as long as width of head. Thorax very strongly arched. Pronotum nearly vertical, long, smooth. Forewings 2.5 times as long as wide,

* New name for *Freysuila* Schwarz (*nec Freysuila* Aleman 1891). The name **Coelocara** is formed from the Greek adjective koilos—concave and *kara,* G.f. noun—head.

† From *tenuis -e,* L. adj.—slender + *pennis,* L. noun—wing.

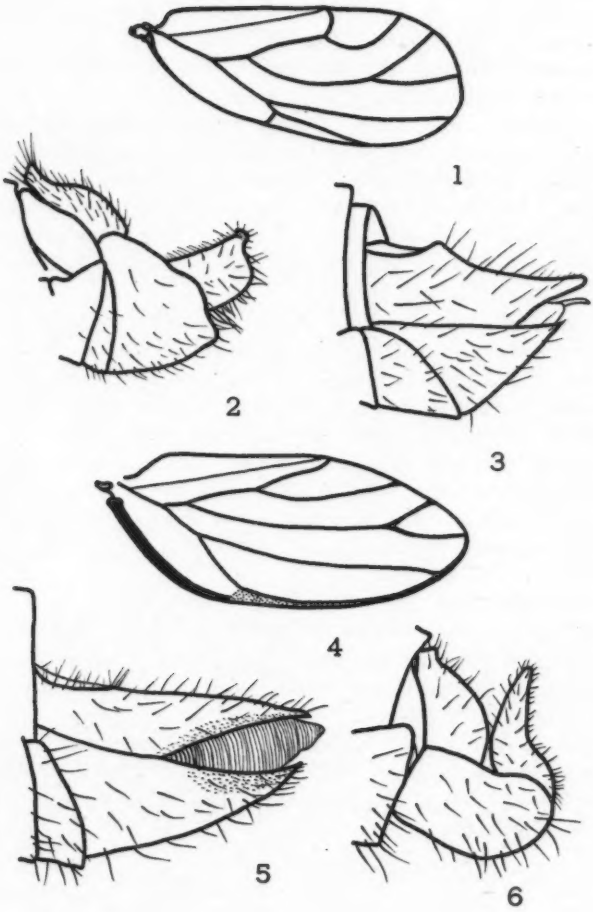
broad basally, tapering to slender rounded tips; veins setate, basal vein, R + M + Cu very short, R and M + Cu very short also, marginal cells elongate, cubital much larger than medial, pterostigma prominent. Legs short and stout.

Genitalia: Male genitalia small. Proctiger straight, roundly produced caudad. Forceps as long as proctiger; in lateral view broad basally, tapered to blunt apices, bent cephalad, then caudad; in caudal view slender, sharply incurved apically to blunt, black tips. Female genital segment about as long as rest of abdomen; dorsal valve elongate, slightly downcurved to blunt apex; ventral valve acute, upcurved, slightly shorter than dorsal; both valves with numerous short retrorse setae toward apex.

Described from a series of four males and seven females from Wajay and Santiago de las Vegas, Habana, CUBA, A. R. Otero collector. They were found breeding on shoots of "guairaje" (*Eugenia axillaris* (Sw.) Willd.) in February and May and are accompanied by nymphs of several instars. Bruner writes, "The nymphs were present in abundance, largely covered with a white, transparent mucilaginous substance, and the leaves were curled in a manner similar to an aphid attack on some plants." Five females in the United States National Museum are identical with the exception of the presence of two brown spots and an incomplete median line on the prescutum and six brown lines on the scutum. The latter specimens were taken on Key West by E. A. Schwarz in March.

Holotype, male, *allotype,* female, in author's collection. Paratypes in the United States National Museum and author's collection.

This species resembles *K. arcuata* Crawford but may readily be distinguished by its smaller size and lighter color. Miss Louise M. Russell of the National Museum has kindly compared the allotype with the type of *arcuata* and has noted various other differences chief of which are the following: In *arcuata* the wing is more angular at the apex; the vertex is nearly flat; the genae are about as long as the vertex and strongly reflexed against the anterior coxae.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Heteropsylla distincta new species *

Figs. 1, 2, 3

Length to tip of folded wings 2.25 mm.

Color: Uniformly yellowish green. Tip of antennae dark, eyes red, wings hyalline.

Structure: Head large. Vertex narrowed anteriorly, distinctly separated from genae. Genae somewhat produced as small but definite processes. Frons not completely covered by genae. Antennae 1.75 times as long as width of head. Thorax well arched. Forewings about 2.5 times as long as wide; pterostigma large, Rs straight, marginal cells large, medial elongate. Hind tibiae with large basal spur.

Genitalia: Male genitalia large. Proctiger strongly narrowed apically, roundly produced caudad in middle. Forceps about .66 as long as proctiger; in lateral view very broad, nearly parallel sided, anterior margin straight to apex, caudal margin sharply excavate forming a slender, blunt, black tipped apical portion; in caudal view stout, bowed, apices truncate, black, touching. Aedeagus with large, complex apical portion. Female genital segment shorter than rest of abdomen; dorsal valve slender apically, slightly upturned to blunt apex; ventral valve shorter than dorsal, acute.

Holotype, male, *allotype,* female, Viñales, CUBA, April 15, 1930, S. C. Bruner collector. Taken on the foliage of "moruro rojo," *Pithecolobium arboreum* (L.) Urban. One male and five female paratypes same data. Holotype, allotype and paratypes in author's collection.

This species differs markedly from the previously known species of *Heteropsylla* in the male genitalia. The inner elongate process present on the forceps of most of the others is completely lacking here.

1. *Heteropsylla distincta*—forewing
2. *Heteropsylla distincta*—male genitalia
3. *Heteropsylla distincta*—female genitalia
4. *Katacephala tenuipennis*—forewing
5. *Katacephala tenuipennis*—female genitalia
6. *Katacephala tenuipennis*—male genitalia

* *distinctus -a -um,* L. adj.—separated, distinct.

A Summary of the Mormon Cricket (Anabrus simplex) (Tettigoniidae: Orthoptera)

By Ira La Rivers, Bremerton, Washington

(*Continued from page 77*)

During 1939 Mormon cricket fieldwork in northern Nevada, the relationship between the wasp and cricket was worked out in detail (La Rivers MS.). An area a mile long by one-half mile wide was invaded by a band of crickets and their attendant wasps while control work was being pressed against other bands in the same region. This area, lying on a ridge, was unmolested, and observations made during the period that wasp and cricket activity was at a maximum. Sampling stations were established and data obtained on observable phases of the complex. It was estimated that a round total in excess of 500,000 crickets were killed by the approximate 30,000 wasps present, whose procedure was to dig a burrow in the loose soil, capture generally two crickets, paralyze them by stinging the ventral thoracic ganglia, and drag them into the burrow, deposit an egg on each victim, then close the burrow and repeat the performance elsewhere. However, the decidedly beneficial work of the wasp was seriously affected by activities of three parasites of the wasp, and five active predators. The parasites, two sarcophagid flies, *Eumacronychia elita* Townsend and *Euaraba tergata* (Coquillett) and the large bembicid wasp *Stizoides unicinctus* (Say) invaded the burrows of *Chlorion laeviventris* and utilized the paralyzed crickets as food for their own larvae and eggs. The sarcophagids, too small to dig, took advantage of the wasp's absence from the burrow to larviposit up to 20 larvae on each cricket, while the bembicid dug up completed burrows, being but slightly smaller than the cricket wasp, chewed the latter's eggs, and deposited her own. It was estimated that an approximate 45,000 wasps, or nearly 10 percent of the theoretical hatch of *laeviventris,* were destroyed by these three parasites alone. The five predators, preying as they did upon the adult wasps and not upon the theoretical hatch, took less toll, but this was sufficient to indicate a 12 percent kill in the

most heavily concentrated sector, which did not, however, apply to the areas of lesser concentration. Chief of these predators were the Short-tailed Grasshopper mouse (*Onychomys leucogaster brevicaudus* Merriam) and the Sierra shrew (*Sorex vagrans amoenus* Merriam). Three species of birds, the Sage thrasher (*Oreoscoptes montanus* (Townsend)), the Brewer blackbird (*Euphagus cyanocephalus* (Wagler)), and the Sparrow falcon (*Falco sparverius* Linné) played minor roles.

It had been stated that Mormon crickets, being cannibalistic, suffered from no prominent diseases, but C. V. Riley recorded hairworms as killing crickets in Idaho as early as 1880. Wakeland and Shull (1936) reported the species of hairworm involved as *Gordius villoti* Rosa, and recorded individual parasites up to 48 inches long. Those infested crickets which were not killed were rendered infertile, but the parasite was adjudged a possible control factor only in the more humid sections of the crickets' range, which, unfortunately, represent but a small portion of the animals' total economic distribution.

In northern Nevada, a given sample showed approximately one-third of the crickets to be infected with the large flesh fly *Sarcophaga tuberosa* Pand. (La Rivers MS.). There is some evidence to indicate that crickets so infected were rendered infertile. However, this flesh fly was extensively preyed upon, in certain localities, by the small bembicid wasp *Stictiella pulla* (Handlirsch), thereby limiting its usefulness (La Rivers 1942).

Practically the entire extent of the Mormon crickets' distribution is in the sagebrush country typical of semi-arid intermontane portions of the western United States, with some overflow into adjacent lowlands, as the western edge of the Great Plains and the Sacramento Valley. Over much of this area, extremes of temperature prevail, with winters cold and snow-bearing, and summers warm-to-very-hot in the valleys. The crickets hatch out between March and June, depending upon elevation and temperature, and so must tolerate wide ranges in temperature. Once hatched, they are hardy and resistant to temperature changes, and have been known to survive cold, snowy springs following warm, open winters if they can find

food during the inclement spell. Cowan (1929) determined the active ground temperature range of the species to be approximately 40° F. to 100° F. (4.4° C. to 37.7° C.). In northern Nevada, crickets were found actively migrating at ground temperatures between 111.2° F. (44° C.) and 120° F. (49° C.); others were seen crossing an open flat into the face of a bitter wind varying from 6° C. to 9° C. (42.8° F. to 48.2° F.) two inches above the ground (La Rivers 1941).

The exact extent and nature of damage caused by the Mormon cricket is difficult to determine, but recent studies have thrown much light on the matter. Early reports credited the insects with eating practically all types of succulent vegetation, and they have been known to strip clothes lines and wall paper, but detailed information was lacking. Their omnivorousness has always been acknowledged. "We know of no agricultural plant that is immune from attack" (Corkins 1923). In 1938 and 1939, Swain (1940) made range damage surveys in epidemic areas throughout several Western states, and recorded a list of 403 plants utilized by the cricket for food. Cultivated plants were preferred to adjacent range vegetation, and the reproductive portions of plants were noted to be more often eaten than the vegetative parts. More range loss was recorded in sagebrush associes than in tall grass-mixed prairie associations, and regions of conifers and deciduous trees were often greatly damaged by crickets attracted to the shade.

"Calculation of Mormon cricket damage to tenth-acre plots showed losses in seasonal forage production for cattle and horses ranging from less than one to 100 percent. Losses of total dry weight of herbage reached 50 percent in two instances. One plot lost 56 percent of total dry weight of herbage, which is comparable to a loss of 483 pounds per acre.

"In a few limited areas almost complete destruction of seasonal forage production occurred during two successive years and, presumably, will occur again" (Swain 1940).

It is well known that cannibalism increases among Mormon crickets during the latter part of the season, when forage is scarcer and many crickets are weakened and near natural death.

On occasion, they can become predominantly carnivorous. Cyrus Thomas, an early Federal entomologist, wrote in 1872: "But the strangest part of its history is that it will go in pursuit of and catch and eat the Cicada. This latter insect also made its appearance in this valley [Cache Valley, Utah] the past season in immense numbers, covering the grass and sage and other bushes, especially those which formed a fringe along the little stream. Up these the *Anabrus* would cautiously climb, reach out with its foreleg, and plant its claw in its victim's wing; once the fatal claw secured a hold, the Cicada was doomed, for without ceremony it was at once sacrificed to the voracious appetite of its captor. No uniformity appeared to be preserved in this process; sometimes they would commence with the thorax, at others with the head, not even taking the trouble to remove the legs or wings."

In northern Nevada, the author found crickets feeding on any animal matter available, such as cricket wasps (*Chlorion laeviventris*) abandoned by mammals, and even cast-aside bodies of the mammals themselves which had been trapped in rodent traps (*Sorex vagrans amoenus, Onychomys leucogaster brevicaudus, Peromyscus maniculatus sonoriensis*). In one instance (and there must have been others) eight miles south-southeast of Mountain City, Nevada, a nest of half-grown Brewer sparrows (*Spizella breweri* Cassin) was devoured by a swarm of crickets. It was early July, and the nest had been first noted several days before, at which time no crickets were about. The day before the incident, a large migrating band of crickets had invaded the sagebrush ridge on which the nest was located. While following a wandering cricket wasp (*Chlorion laeviventris*) returning to her burrow with a paralyzed cricket, I passed by the nest and noticed a mass of struggling crickets on the ground beneath the bush. They hopped for cover and I found two of the nestlings dead with large patches of skin and viscera removed. Another nestling lay on the other side of the bush, but the fourth was never found. By the following morning, little but bones and bills remained of the unfortunate birds (1939).

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PERSONAL

Professor Roger C. Smith, head of the Department of Entomology of Kansas State College, has been granted leave of absence to join the increasing number of entomologists assisting the government with war problems. He has become professional allocations specialist of the War Manpower Commission for agricultural and biological sciences, and is now located in Washington, D. C.

Notes on the Streckeri Group of the Genus Megathymus (Lepidoptera, Rhopalocera)

By H. A. Freeman, White Deer, Texas

Much confusion has centered around the *streckeri* group of the genus *Megathymus* for a number of years. The writer * is attempting to bring some light upon part of that complex, namely the status of *streckeri* (Skinner), *texana* Barnes & McDunnough, *albocincta* Holland and *leussleri* Holland. Concerning the other two members of this group, *cofaqui* (Strecker) and *ursus* Poling, little will be said at the present. *M. cofaqui* is apparently a valid species occurring in Georgia and Florida. As there are only three known specimens of *ursus* a definite knowledge of that supposed species is impossible at the present.

Megathymus streckeri (Skinner)

The ♂♂ of this species are characterized by their grayish-black coloration, by light yellow spots on the upper surface of the primaries, by the absence of or else poorly developed three large submarginal spots on the under surface of the primaries, and by the well-developed white spots and numerous dark blotches on the under surface of the secondaries. The ♀♀ are characterized by their grayish-black coloration, by lemon-yellow spots on the upper surface of the primaries, by no submarginal spots on the upper surface of the secondaries, except rarely a single spot, and by the well-developed white spots and dark blotches on the under surface of the secondaries.

The genitalia of this species resemble those of *cofaqui* (Strecker) except the valvae are shorter and broader in comparison.

M. streckeri occurs in Colorado, northern New Mexico, parts of Arizona, possibly southeastern Utah and the northwestern tip of the panhandle of Texas, during May, June and July.

* The writer is indebted to D. B. Stallings and J. R. Turner, Caldwell, Kansas, for valuable information on this group and for the loan of many fine specimens.

Megathymus texana Barnes and McDunnough

Syn. *leussleri* Holland

The ♂♂ of *texana* differ from *streckeri* by their black coloration, by bright lemon-yellow spots on the upper surface of the primaries, by the reappearance of all the spots on the under surface of the primaries, these spots having the same coloration as above, and by the smaller number of white spots and the absence of dark blotches on the under surface of the secondaries. The ♀♀ differ by their fuscous coloration, by large orange-yellow spots on the primaries, by a well-defined submarginal band of orange-yellow spots and orange-yellow border on the secondaries, and by the smaller number of creamy-white spots and the absence of dark blotches on the under surface of the secondaries.

For some time *leussleri* Holland was considered to be a separate species but after the writer located restricted habitats where *texana* was abundant and after making a careful study of the genitalia of Texas examples and specimens from Valentine, Nebraska, the two were found to be the same. It is impossible to separate them by superficial or genitalic characters.

In all previous publications *texana* has been considered as a smaller and darker subspecies of *streckeri*. This is only partly true as it is certainly darker but as a general rule it is larger. Possibly the reason for this lies in the fact that Barnes and McDunnough did not describe the typical ♀ of *texana* in their original description. Their discussion of the two ♀♀ agrees better with a smaller and darker form that is by no means common. Holland's description of the ♀ of *leussleri* applies to the typical form of *texana*.

The genitalia of *texana* differ from those of *streckeri* by the more elongated valvae, structural differences in the teeth that are so prominent at the posterior extremity of the valve and differences in the uncus.

M. texana occurs over a wide area extending from the Mesa del Norte, Mexico to Rapid City, South Dakota. It appears to be more common in the vicinity of White Deer, Texas than anywhere else. In its southern range this species flies from April to June and in its northern range during June and July.

Megathymus texana form *albocincta* Holland

The ♂♂ of the form *albocincta* differ from typical *texana* by their smaller size, *albocincta* averages 46 mm. whereas *texana* averages 68 mm., by the absence of yellow scales and hairs at the base of the wings on the upper surface, by the spots on the primaries being lighter in color and by the fewer white spots on the under surface of the secondaries. The ♀♀ of this form differ in being smaller, averaging 45 mm., by having the ground color usually black instead of brown, by having fewer orange-yellow hairs and scales at the base of the wings and by having the spots on the under surface of the secondaries usually clear white instead of creamy.

When Dr. Holland described *albocincta* he apparently used a normal ♂ specimen of *texana* as his ♀ type, judging from his original description, because he failed to mention spots on the upper surface of the secondaries and other ♀ characteristics. His ♂ type certainly belongs to this smaller and darker form of *texana*.

Genitalic studies were made of a number of specimens from Texas and Nebraska and it was found that this form has genitalia identical with those of typical *texana*.

Form *albocincta* occurs wherever you find typical *texana;* however the writer has found it more abundantly on the northeastern rim of the Palo Duro Canyon, below Claude, Texas, during early May, than anywhere else.

NOTES AND NEWS IN ENTOMOLOGY

Under this heading we present from time to time short reviews, notes, news and comments on entomology throughout the world. Contributions from readers are solicited and will be acknowledged when used.

Sewage filter beds afford an unusually constant wet environment characterized by high nitrogen content, low oxygen tension and a smaller temperature range than the surrounding country (temperature elevated in winter by vital activity of the included organisms, lowered in summer by evaporation and effect of depth). In this specialized environment there is a special fauna, small in number of species but commonly enormous in

numbers of individuals. The flora is also restricted, and is characterized, of course, by the stupendous numbers of putrefactive bacteria. The bacteria are so abundant that sewage beds are sometimes referred to as "bacteria beds."

The constancy of the fauna and flora has permitted Lloyd, Graham and Reynoldson [1] to make a detailed study of animal competition on several sets of sewage beds in England. The bed growth consists of putrefactive bacteria, fungi and protozoa with a relatively thin coat of algae at the surface. Oligochaete worms, snails, insects, mites and spiders are found, but the fauna is a balanced one dominated by an oligochaete and several species of dipterous larvae, namely *Psychoda* (Psychodidae), *Metriocnemus* and *Spaniotoma* (Chironomidae).

The seasonal abundance of *Psychoda* species departs from what it would be if determined by only climatic influences. They prefer the topmost foot of the medium, but when chironomids and oligochaetes are abundant they are found most abundantly at greater depths. The chironomids, especially *Metriocnemus,* are distinctly predatory especially when overcrowding depletes their normal food.

The more recent papers by Lloyd (1943) add to the ecological picture. The numbers of *Metriocnemus* are controlled principally by the June weather. If June is cold and wet a large brood of larvae becomes established on the beds. The eggs of other species ovipositing a month later are largely destroyed by the activities of these larvae. When *Spaniotoma* is thus reduced, this potential predator is uncommon in the depths of the beds, and by this *Psychoda* species benefit. So the weather-controlled fluctuations of *Metriocnemus* cause competition factors to affect both *Spaniotoma* and *Psychoda.* The competition goes further than just including these flies. A warm winter will cause the oligochaete worms to accelerate their cycle and so adversely affect *Metriocnemus.* In all cases the influences are thought to be exerted mainly at the time of establishment of broods rather than later in the cycle.

[1] L. L. Lloyd, J. F. Graham and T. B. Reynoldson. Ann. Appl. Biol., 27: 122–150. 1940.
L. L. Lloyd. Trans. Roy. Soc. trop. Med. Hyg., 35: 93–104. 1941.
L. L. Lloyd. Ann. Appl. Biol., 30: 47–60, 358–364. 1943.

Competition is not absent in beds where *Psychoda alternata* is almost free from other insect competitors (due to tolerating stronger sewage containing chemical wastes). Under these conditions, Lloyd (1943) shows that *Psychoda* tends to give rise to alternating large and small generations. These develop concurrently but emerge alternately. The larger generation dwarfs and depletes the smaller generation by competition since older larvae are more successful at getting food. As one might expect, there is a correlated but reverse periodicity in the solid discharges (food) from the filter beds. In *Spaniotoma,* Lloyd (1941) was able to show that the establishment of such alternating large and small broods was initiated by irregular temperatures of fall and spring tending to split broods. Warm spells tend to fuse adjacent peaks of development; cold spells tend to split and separate the peaks. The fusion is most noticeable in the spring, splitting in the fall. Lloyd things that this explanation, with the additional factor of competition, will account for the alternating broods of *Psychoda alternata.* In fact, Lloyd goes further and suggests that any uniformly distributed population of an insect with rapid cycles and no diapause would naturally tend to assume this form of seasonal rhythm. A. G. RICHARDS, JR.

Current Entomological Literature

COMPILED BY THE EDITORIAL STAFF.

Under the above head it is intended to note papers received at the Academy of Natural Sciences of Philadelphia and the University of Pennsylvania, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species will be recorded.

This list gives references of the current or preceding year unless otherwise noted. Continued papers, with few exceptions, are recorded only at their first installment.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

NOTE: The figures within brackets [ ] refer to the journal in which the paper appeared, as numbered in the List of Journals given at the end of the literature. The number of the volume, and in some cases, the part, heft, &c. is followed by a colon (:). References to papers containing new forms or names not so stated in titles are followed by (*); if containing keys are followed by (k); papers pertaining exclusively to Neotropical species, and not so indicated in the title, have the symbol (S).

Papers published in ENTOMOLOGICAL NEWS are not listed.

GENERAL—Allan, P. B. M.—Substitute foodplants. [21] 56: 5–7. **Beeson, C. F. C.**—Influence of insects on the regeneration, composition and destruction of forests. [109] 8: 48–51. **Campbell & Moulton** (Editors).—Laboratory procedures in studies of the chemical control of insects. Publication of the Amer. Assoc. Adv. Sci. No. 20. Science Press, Lancaster, Pa. 206 pages, 1943. Review in [84] 25: 122. **Craig, W.**—(See under physiology.) **Diver, C.**—Insects limited by general conditions imposed by plant communities. [109] 8: 44–48. **Felt, Ephraim Porter,** 1868–1943.—Obituary by Muesebeck & Collins. [10] 46: 27–29, photo. (Obituary) by A. F. Burgess. [12] 36: 950–52 (photo). **Flanders, S. E.**—Indirect hyperparasitism and observations on three sps. of indirect hyperparasites. [12] 36: 921–26. **Forbes, W. T. M.**—Substitute food-plants. [21] 56: 8. **Gibson, A.**—International entomology. [12] 36: 944–45. **Grinnell, Fordyce, Jr.**—Obituary. [38] 42: 136–37. **Hovanitz, W.**—The ecological significance of the color phases of Colias chrysotheme in N. America. [84] 25: 45–60. **Keifer, H. H.**—Applied entomological taxonomy. [55] 20: 1–6. **Lloyd, Ll.**—Materials for a study in animal competition. Part III. The seasonal rhythm of Psychoda alternata and an effect of intraspecific competition. [20] 30: 358–63. **McLaine, Leonard Septimus,** 1887–1943.—(Obituary) by H. T. Fernald. [12] 36: 946–47 (photo). **Middlekauff, W. W.**—A rapid method for making permanent mounts of mosquito larvae. [68] 99 (2567): 206. **Newell, Wilmon,** 1878–1943.—(Obituary) by J. T. Creighton. [12] 36: 947–49 (photo). **Parker, G. H.**—Coloration of animals with special reference to change of color. [Proc. R. Inst. Canad. Inst.] (IIIA), 8: 39–41. **Pickett, A. D.**—Blueberry insects and their control. [Canada Dept. Agr., Farm. Bull.] 120: 24–28. **Poulton, Edward Bagnall.**—Obituary, by G. D. Hale Carpenter. [8] 80: 24. **Salisbury, E. J.**—Interrelations of plants and insects; the place of both in the Eco-system. [109] 8: 39–42. **Symposium** on the organization, direction and support of research. [Proc. Amer. Phil. Soc.] 87: 291–364. **Torre-Bueno, J. R.**—Part versus portion. [19] 38: 177. **Van Cleave, H. J.**—Continuation of the program of the International Commission on Zoological Nomenclature. [68] 99 (2567): 200.

ANATOMY, PHYSIOLOGY, MEDICAL—Collins & Machado.—Reactions of the codling moth to artificial light

and the use of light traps in its control. [12] 36: 885–93. **Craig, W.**—The twilight ceremonies of horseflies and birds. [68] 99: 125–126. **Fernando, W.**—Anatomy and histology of the alimentary canal of Tridactylus variegatus (Orthop.: Gryllid). [Spolia Zeylanica] 23: 71–78, ill. **Hastings & Pepper.**—Studies on body fluids of seven orthopterans, their pH, buffering capacity, and effect on solubility of fractionated insecticides. [12] 36: 857–64. **Hill, D. L.**—Certain relationships between carbohydrate and respiratory metabolism during embryonic development (Orthoptera). [129] 87: 21. **Jahn & Wulff.**—Spectral sensitivity of the compound eye of Dytiscus. [129] 87: 24. **Lichen, M. M.**—Relative growth in the garden centipede. [Growth] 7: 323–29. **Milne & Milne.**—Selection of colored lights by night-flying insects. [129] 87: 29. **Noland, J. L.**—A new method for lethal temperature determinations; studies on Periplaneta americana. [129] 87: 32. **Oliver, C. P.**—A case of change in dominance of a dominant mutant in Drosophila melanogaster. [129] 87: 33. **Park, T.**—Interspecies-competition within populations of the genus Tribolium. [129] 87: 34. **Park & Davis.**—Further analysis of fecundity in the flour bettles Tribolium confusum and T. castaneum. [129] 87: 35. **Park, Davis & Horowitz.**—"Ebony": a new mutation in the flour beetle, Tribolium confusum. [129] 87: 35. **Pennak & McColl.**—An experimental study of oxygen absorption in some damselfly naiads. [Jour. Cell. & Comp. Physiol.] 23: 1–10. **Reese, A. M.**—The anatomy of the poison glands in the black widow spider, Latrodectus mactans. [129] 87: 40. **Scharrer, B.**—The influence of the corpora allata on egg development in an orthopteran (Leucophaea maderae). [129] 87: 43. **Villee, C. A.**—Phenogenetic studies of the mutant bithorax-34E of Drosophila melanogaster. [129] 87: 47. **Wulff & Jahn.**—Correlation of E. M. F. and photochemical changes in the dark-adapted insect eye. [129] 87: 51.

ARACHNIDA AND MYRIOPODA—**Cooley, R. A.**—Ixodes neotomae, a n. sp. from Calif. (Ixodid). [55] 20: 7–12, ill. **Hoff, C. C.**—Preliminary study of the Hydracarina of Reelfoot Lake, Tenn. [49] 19: 45–69. **Keifer, H. H.**—Eriophyid studies XIII. [11] 32: 212–22, ill. (*). **Lane, F.**—Reparos a nomenclatura de alguns escolopendrideos descr. pelo W. Buecherl. [77] 3: 219–20. **Lichen, M. M.**—(See under physiology.) **Melvin, Smith & Gra-**

ham.—Some observations on chiggers. [12] 36: 940. **Muma, M. H.**—Spider deformities. [Bull. Nat. Hist. Soc. Maryland] 13: 80–81, ill. **Piza, Jr., S. deT.**—Novos Gonyleptidas Brasileiros. [77] 3: 39–60, ill. **Reese, A. M.**—(See under physiology.) **Schubart, O.**—Diplopoda de Pirassununga II. Sobre um diplopodo termitofilo do planalto Paulistano. [77] 3: 16–72, ill. (*). Esp. n. das fam. Strongylosomidae e Leptodesmidae da ordem Proterospermophora do interior dos Est. de São Paulo e de Matogrosso. [77] 3: 127–64, ill. **Soares, B. M.**—Novos tomisidas Brasileiros. [77] 3: 1–17, ill. (*). Notas sobre opiloes. [77] 3: 193–98; 221–28. Aracnideos de Goiaz Coligios pelo F. Lane. I. Opilioes. II. Afantoquilidas e Tomisidas. [77] 3: 205–18, ill.

THE SMALLER ORDERS—**Emerson & Miller.**—Key to the termites of Florida. [Proc. Fla. Acad. Sci.] 6: 108–109. **Fraser, F. C.**—Some critical notes upon the Selysian synopsis to the Calopterygines (Odon). [8] 80: 15. **Fuller, H. S.**—Historical note on Notiopsylla kerguelensis, an antarctic flea. [19] 38: 164–67. **Guimaraes, L. R.**—Sobre alguns gen. e sps. de Heptapsogasteridae (Malloph.). [77] 3: 19–37, ill. (S). **Hanson, J. F.**—Studies on the Plecoptera of N. Amer. 4. Further notes on the Capniidae. [19] 38: 155–63, ill. (*). **Miller & Miller.**—Preliminary study on the distribution and habits of S. Florida termites. [Proc. Fla. Acad. Sci.] 6: 101–107. **Needham, J. G.**—New sps. of N. Amer. gomphine dragonflies and life-history notes on some of them. [19] 38: 143–52, ill. Notes on some gomphine dragonflies from Venezuela and Guatemala. [46] 2: 197–206, ill. (*). **Prince, F. M.**—Descr. of three n. sps. of Thrassis and the female of T. bacchi and T. pansus (Siphonapt.). [55] 20: 13–19, ill. **Ross, E. S.**—Revision of the Embioptera, or web-spinners, of the New World. [50] 94: 401–504, ill. (*). **Whitehouse, F. C.**—A guide to the study of dragonflies of Jamaica. [Inst. of Jamaica, Bull.] Sci. Ser., no. 3: 69 pp.

ORTHOPTERA—**Burr, M.**—Grasshopper gossip. I. Genus Platyceleis-Metrioptera. [21] 56: 3–5. **Chagnon, G.**—Contribution à l'étude des Orthopteres et des Dermapteres du Quebec. [98] 71: 15–39, ill. (cont.). **Günther, K.**—Die Phasmoiden der "Borneo-Expedition Dr. Nieuwenhuis" aus dem Stromgebeit des oberen Mahakam. [86] 19: 149–72, ill. (*). **Rehn, J. A. G.**—Critical notes on and descr. of

Amer. steirodont katydids (Tettigon.). I. Review of the gen. Steirodon of authors, Phyllolophus n. n. [1] 69: 159–69, ill. (S*). **Urquhart, F. A.**—Ecological study of the saltatoria of Point Pelee, Ontario. [51] no. 50: 87 pp., ill.

HEMIPTERA—Burnett, T.—(See under Hymenoptera.) **Caldwell, J. S.**—Notes on the gen. Bothriocera (Cixiid). [Lloydia] 6: 318–25, ill. (*). **DeLong, D. M.**—A new gen. (Tumeus) and six n. sps. of leafhoppers closely related to Cloanthanus. [19] 38: 168–74, ill. **Drake, C. J.**—A new Neotropical vesiid (Reduviid). [46] 2: 207–209. **Gomez-Menor, J.**—Contribucion al conocimiento de los Aleyrodidos de Espana. [86] 19: 173–209, ill.

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